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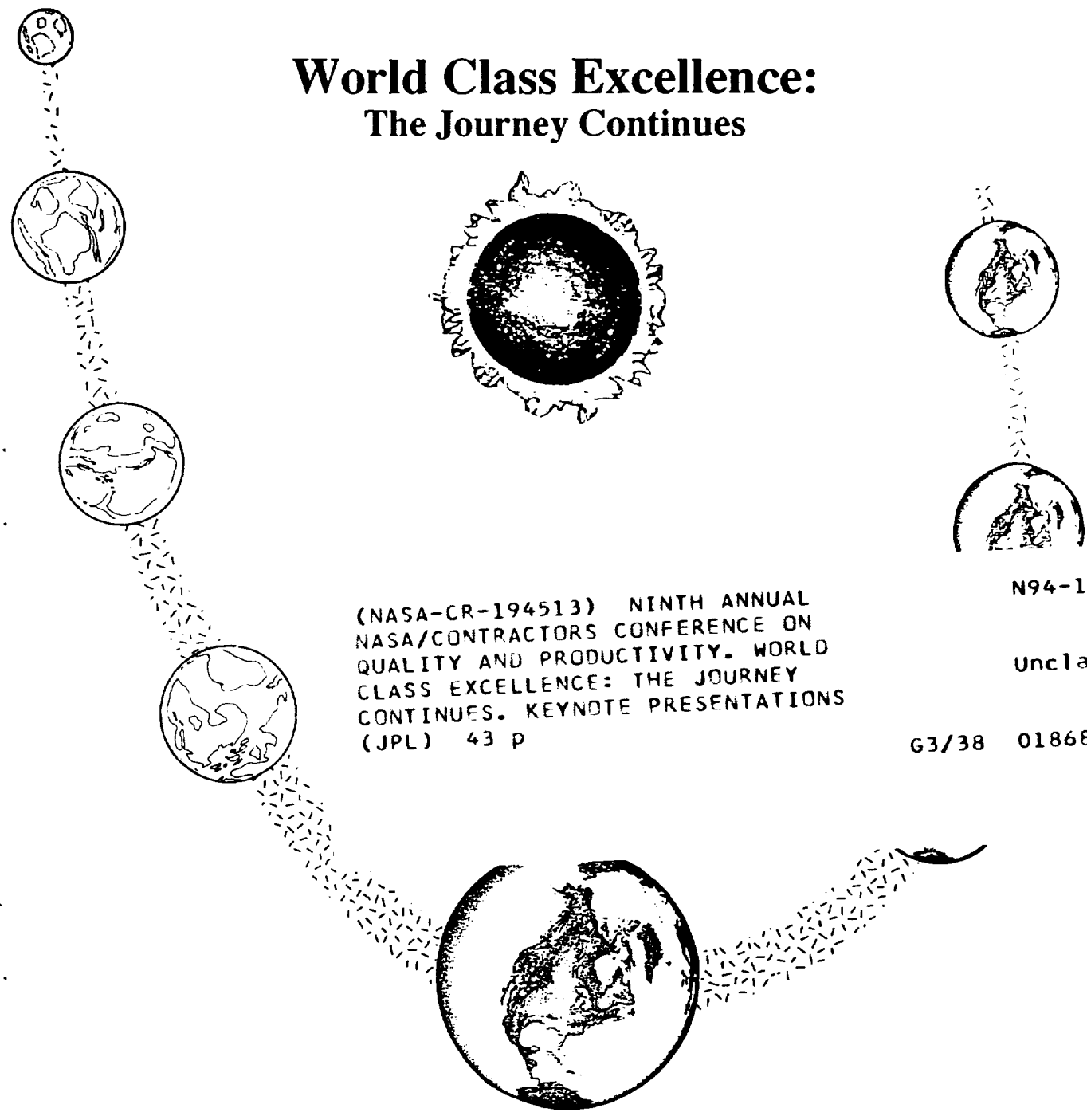
Ninth Annual NASA/Contractors Conference On Quality and Productivity

World Class Excellence:
The Journey Continues



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9th Annual NASA/Contractors Conference on Quality and Productivity

"World Class Excellence - The Journey Continues"

Hosted by:
Jet Propulsion Laboratory
Pasadena, CA
October 20-21, 1992

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WELCOME

DR. EDWARD C. STONE
Director, Jet Propulsion Laboratory
National Aeronautics and Space Administration

On behalf of NASA's Jet Propulsion Laboratory, it's a great pleasure to welcome all of you to the Ninth Annual NASA/Contractors Conference on Quality and Productivity.

This conference provides an excellent forum for the members of the NASA community to share their experience and expertise in an effort to continuously improve the quality of the U.S. space program.

As all of you are aware, we have entered a post cold war era in which there is now significant cultural and structural change underway. At the moment, this change includes a number of negative factors, such as a stubborn recession and a high unemployment rate.

However, many American industries are responding to this changing environment by restructuring to become more streamlined and more efficiently run organizations that are responsible and responsive to their customers' needs. Companies and government agencies are adopting the Total Quality Management approach specifically to accommodate this changing environment.

At JPL, we have initiated three main activities. First, we are providing training classes for every employee where they learn to speak a common vocabulary and how to improve both individual and team performance.

Second, we have put in place a number of process action teams where small groups of employees focus on staff processes that need improvement. And, finally, we have developed our vision, mission, values, and a set of strategic goals for change by which we will be guided. JPL is committed to making TQM a part of our culture.

Of course, TQM has been criticized as just another fad that will be replaced by something else in a few years. However, any organization that is serious about developing TQM attitudes must accept the fact that this is not a revolutionary process, but an evolutionary one that will take many years to fully implement. Some of the most successful companies have been practicing TQM for 10 to 40 years or more.

Dr. Edward C. Stone

This conference is an indication that the concept of quality and excellence is not just a passing fad at NASA. This is, after all, the ninth annual conference on quality.

This year's theme, "World Class Excellence: The Journey Continues," emphasizes that NASA will continue to strive for excellence in everything it does.

Over the past 30 years, I have worked with the people at JPL and NASA and with many of the NASA contractors and have first-hand knowledge of the commitment, dedication, and excellence that exists in this space community. I know that the people in this community are motivated by a challenge and will continue to set the standards in the area of quality and productivity.

"NASA'S APPROACH TO CONTINUAL IMPROVEMENT: INTEGRATION AND COOPERATION"

LAURIE A. BROEDLING, PH.D.
Associate Administrator for Continual Improvement
National Aeronautics and Space Administration

One of the benefits that a space program brings to the world is a sense of perspective. A space program not only allows us to look out into space, it also lets us look back at earth. From the perspective of space orbit, earth looks like a small place. The perspective is one of all of humanity having to share a planet and therefore to work cooperatively to make the best use of the earth's resources.

At a national level, we also must recognize that we are mutually dependent. In the face of economic pressures, we should recognize that a rising tide raises all ships. A win-win approach involving mutual cooperation rather than internal competition is a preferable way to bolster U.S. competitiveness in the new world marketplace.

Within NASA's environment, we realize that a variety of world and national changes dictate that we find a significant way to do more with less. Our solution is to adopt an approach called continual improvement, often known as Total Quality Management (TQM).

For the first time, NASA has begun a corporate-wide, top-down, approach to the implementation of a formal continual improvement initiative internal to NASA itself. While in the past there have been a variety of individual quality initiatives within parts of NASA, there has never been a systematic approach across all of NASA. This is reflective of NASA Administrator Dan Goldin's personal commitment to the TQM philosophy.

There are several aspects to the new NASA-wide approach. One is to develop quality policies and concepts that will be used across the Agency. Second is to develop and execute a strategic plan for the continual improvement initiative. Third is to develop and integrate organizational quality structures to create and implement quality policy and plans. We have formed a Quality Steering Team, with members from the highest levels of NASA management, which has begun the effort. The Quality Steering Team will become linked to other existing quality structures, such as the Headquarters Continual Improvement Council and Field Center councils, for policy development. Fourth, we are putting a lot of emphasis on education and training, especially of top management.

Dr. Laurie A. Broedling

TQM education and training is a critical factor for success in organizational quality transformation. Top management education to date has included two-day "Continuous Process Improvement Boot Camp," which was experiential training, a recent day spent with Dr. Deming, and a half-day session with Dr. Rubenstein on creative problem-solving as it pertains to quality management.

To establish a theme for NASA's approach to continual improvement, we are taking a page out of Dr. Deming's book. The most important concept he conveyed to us is that, because an organization is a

system, it needs to be managed as such. This means fostering cooperation among various units of the organization and discouraging competition among units. Left to their own devices, units will tend to try to optimize themselves. This contributes to overall systems suboptimization because the units tend to compete with other units. In fact, organizational units are linked together as a set of internal customer-supplier chains, and they should be cooperating to achieve overall organizational goals. In the U.S., we have a long way to go in achieving a management approach which truly fosters systems integration in our organizations. The cornerstone of NASA's continual improvement effort will be to achieve this paradigm shift.

Turning attention to the other part of the "NASA team," we realize that all organizational enterprises are dependent upon the quality of their supplier base. Nowhere is this truer than in NASA. The success of NASA's mission is dependent on the quality of the products and services that our suppliers provide. These products and services range from scientific findings and information to satellites and space shuttles. We at NASA understand that, in order to improve the quality of what we receive, we must work cooperatively and collaboratively with our suppliers. We must be willing to exchange timely and factual information on the work processes; to shift from an inspection-oriented to a prevention-oriented approach; and to work together to build in quality up-front during our planning and design phases. I have been very pleased to discover that NASA is not starting from an empty slate with respect to cooperation. I have generally been quite impressed with the relationships between NASA and its contractor base. The fact that this conference has been sponsored for the past nine years is one testament to the cooperation characteristic within the NASA team of government and contractors.

Within the context of NASA's continual improvement implementation plan, a part of the plan will be dedicated to ways to encourage suppliers to continually improve total quality and enhance collaboration with our supplier-base. In fact, some specific initiatives are already underway in this regard.

Before addressing some of these initiatives, I want to mention the findings of a study that was recently completed by the Private Sector Council (PSC). This study addressed some significant changes and trends that are occurring in customer-supplier relationships in the private sector. These trends are expected to have a strong impact on purchasing strategies and contract monitoring in the next decade. Findings related to purchasing strategies include policies that are increasingly focused on purchasing for best value, i.e., the total cost associated with a product or service over its life cycle. Factors such as quality and past performance indicators are being incorporated in purchasing decisions. In addition, there is movement to reduce the size of vendor bases, to begin working more cooperatively with suppliers, and to develop long term alliances with selected proven suppliers.

PSC findings related to contract monitoring indicate that buying activities will be working up front with vendors to better clarify requirements, focusing on prevention rather than inspection, working together on problem-solving, establishing process capabilities, and implementing process improvements. There will be increased information sharing as buying activities begin to view vendors as an extension of their internal operations. Finally, the study concluded that there will be more emphasis on TQM in future acquisition and procurement practices since TQM will drive continuous quality improvement.

With this scenario in mind, I want to mention a few initiatives and directions which NASA is starting to take. There are three areas I will address. These are front-end design, source selection, and contract management.

With respect to the first area, if we want to improve the quality of our aeronautical and space systems, then we must work quality issues directly up-front during the design and development phases of acquisition. Unfortunately, in most U.S. organizations, both government and private sector, there has been relatively little institutional focus on the design phase of acquisition; most has been on the production and operations phases. This must change. We want to encourage building quality into systems design as early a possible rather than attempting to detect and correct quality problems in later stages. When these early problems slip past review and oversight mechanisms, they affect performance, reliability, maintainability, affordability, operability, and producibility.

Why is designing in quality so significant? Problems created in the early stages create increasingly significant problems downstream. A commercial example of the impact of design problems was reported by Mr. Hiroshi Hamada, the president of Ricoh Company, Limited. Mr. Hamada stated that, "Soon after we introduced one model of our copier in the United States, we found a malfunction in the product. We had to fix all the machines, including those already sold and installed. That malfunction cost us $590,000. If we had resolved the problem before shipping the product from our plant, we could have fixed it for $17,000; before beginning production, only $368; before procuring parts, $177;

and before making the first components list at the design phase, the cost would have been only $35."* Now, if we consider design problems of such things as aeronautical and space systems, the potential cost savings are staggering.

Concurrent Engineering is one approach to improving design quality which we want to encourage. It is vital that the design of downstream processes required to manufacture, operate, and maintain the end product be included early in the overall systems design. Concurrent Engineering is a methodology for bringing all functional disciplines to bear during the design engineering phase.

Another example is the Acquisition Streamlining Working Group which has been gathering customer information on impediments and obstacles to the current acquisition process. This working group has already identified several areas for immediate testing. With this customer information in hand, the working group is now embarking on a systematic approach to defining and analyzing some of the critical sub-processes within our acquisition system.

Second, if we expect our suppliers to improve quality, we have to be prepared to recognize and reward firms that are truly enhancing their overall quality. One of the most effective ways we can do this is through the supplier selection process. In selecting our suppliers, we should be looking for those who demonstrate high levels of total quality as well as continual quality improvement. Past performance will play a more important role in source selection.

One effort that NASA is pursuing is the Contractor Performance System which is establishing a data base or library of past performance reports on all NASA contracts over $25 million. This data base is available to all NASA source evaluation boards. We are planning on expanding this effort to eventually cover all of our award fee contracts. Within the Department of Defense, the Defense Logistics Agency (DLA) has also developed and is maintaining uniform data base on contractor past performance for Service and DLA procurement activities.

We have other examples. Mid-range procurements, ranging from $25K to $500K, constitute 80% of our contract actions. Our mid-range procurement initiative is focusing on simplifying and reducing the process time of these procurements and establishing authority for these procurements at the lowest possible level. At the Marshall Space Flight Center, an initiative is underway to test and evaluate conducting "Parallel Negotiations." Parallel Negotiations is an approach to improve our negotiation process by fostering improved communication with our suppliers.

Another example is a process action team that examined our grant award process. This process provides research grants to universities and non-profit organizations. The team made 41 process improvement suggestions, the majority of which have been implemented. The result has been a reduction in time to grant awards from roughly 100 days to only 10 days.

A very recent Headquarters initiative is the Contractor Metrics Process Action Team (PAT). This PAT will establish contractor metrics to assist in more effective contract management. A joint NASA/industry team has been established to survey best practices and establish a set of NASA contractor metrics. This will provide our contractors with improved and timely feedback on their performance and will serve as a basis for dialogue between us and our contractors.

We are especially committed to helping NASA's small business suppliers become more competitive through implementing TQM. Dan Goldin has made an organizational commitment to increasing opportunities for small, women-owned, and small disadvantaged businesses. In further promoting cooperation, I want to encourage our prime contractors here today to involve your small subcontractors in your TQM education and training efforts as well as your process improvement initiatives.

With respect to the George M. Low Trophy, we will be spending the next six months enhancing the award process to insure that it is aligned with our quality improvement policy and that it assists our supplier base in understanding our expectations for continually improving quality. We want the total award process to be a constructive experience for all those submitting applications or using criteria for self-evaluation regardless of whether they are ultimately award recipients. Our Quality Steering Team has agreed on an award cycle which will begin in April 1993, with winners announced in April 1994.

Let me turn now to the third area, contract management. A good example of a public sector initiative is the Defense Contract Management Command's (DCMC) In-Plant Quality Evaluation (IQUE) program. DCMC provides contract monitoring services to NASA as well as DoD. Their decades-old in-plant quality assurance program, which emphasized review of contract quality procedures and inspection after manufacturing, has been replaced by a program focusing on early involvement in the manufacturing process to prevent defects, rather than detect them. The intent is to ensure that effective process control techniques are in place as items are manufactured. You will be

hearing more about it from General Klick first thing tomorrow morning.

Partnering is also an approach to improving quality. It has been a great success within the Army Corps of Engineers, and it is currently being tested within NASA for the Advanced Solid Rocket Motor (ASRM) production plant at Yellow Creek and Goddard Space Flight Center's planned Earth Observing System Data Information System Facility. Partnering establishes mutual objectives up-front between customers and suppliers. It leads to lower overall costs, lower performance time, and reduced litigation. Partnering has been very effective in reversing the adversarial relationships by creating mutual objectives and a cooperative approach.

Within NASA, a PAT has been formed to examine the process for managing and controlling government furnished property. This area has been a difficult and time-consuming area for NASA and our contractors. One focus of the PAT will be to establish clear definitions and common terminology for dealing with government-furnished property.

Lastly, this Annual NASA/Contractors Conference is another way that NASA reaches out to our suppliers and stakeholders. NASA's Quality Steering Team will be providing direction to design future conferences that are supportive of our overall mission, vision, and strategic direction. Specifically, we intend to have a NASA quality conference that gives us a forum to exchange information on internal NASA continual improvement efforts as well as a forum to continue to exchange information with our suppliers. In order to plan this new approach our Quality Steering Team has decided to have our next conference in April 1994. This will also enable us to keep the conference in synchronization with the George M. Low Trophy process.

In concluding, I want to stress three requirements that are critical to NASA's successful implementation of continual improvement. The first is the need to design and carry out a systematic approach. The second is the need to align the organization to a common vision, mission, and values. The third is to work on fostering cooperation both within NASA, and with its supplier base in order to achieve this alignment.

None of this will be easy.

Dan Goldin tells a story related by his sister, who teaches in a New York City public school. Her students did not know who her bother was at the time, in May, when our Space Shuttle astronauts recovered the satellite in space. Together, over a three-day period, they watched TV in wonder. According to her, what they learned from watching those astronauts was as follows: They watched them try and fail; try and fail; try and succeed.

At NASA, we recently received a copy of a letter that a boy wrote. The letter is as follows:

> "I read ... that [the] White House has recently said that the U.S. will not build any more Space Shuttles. Tax dollars will be spent on unmanned rockets instead. Ever since I was five I wanted to be an astronaut. Is it really true? Do I need to change my career now?"

Well, young man, don't change your career plans just yet. If we are successful in our continual improvement efforts, we can stretch limited budgets to continue putting humans, as well as unmanned rockets, into space.

President Kennedy said that we chose to go to the moon, "not because it was easy, but because it was hard." Going to the moon was principally an achievement of those in the public sector. We, the NASA government team, were, and still are, in the vanguard of exploring space and we can be in the vanguard of the quality transformation on earth.

* "Quality Progress," November 1991

"COMMITMENT TO TOTAL QUALITY"

LIEUTENANT GENERAL THOMAS R. FERGUSON
United States Air Force
Commander, Air Force Aeronautical Systems Center

It's a pleasure to be here as part of such a distinguished panel, especially to talk about my favorite subject - Quality. As I thought about the panel discussion title, "The Importance of Commitment and Leadership in Implementing Total Quality," I couldn't help but think that implementing TQ is only half the battle - maintaining the TQ thrust, the forward momentum, can sometimes be the biggest challenge a leader or CEO faces.

I was reading an article in Newsweek last month called **The Cost of Quality** about how American businesses have soured on TQM. Basically the author notes that American management plans often have the shelf life of cottage cheese. Does American management have the patience to implement TQ ... and then to wait for the results? TQ requires patience ... discipline ... because it deals fundamentally with process improvement. Unfortunately, what we do best is put out fires.

So I would say to this audience, most of whom already embrace TQ, that you must stay with it to get results. Through different leaders, through hard times, through whatever lies ahead.

Before I proceed, let me give you a little bit of background about the kind of a team Aeronautical Systems Center is and what we do. Our job is to research, develop and acquire weapon systems for the Air Force ... now we're also managing systems throughout their entire life cycle. These systems include airplanes like the B-2 Stealth Bomber, the F-22 Advanced Tactical Fighter and the C-17 transport as well as missiles and other smart bombs. I should add, we develop these systems with our industry partners

Quality has been a management principle for business and government for a long time. We all espoused the virtues of quality but no one really understood until people like Deming and Juran began to get their message across. Maybe I should say until Toyota began to demonstrate these new quality principles where it counts - in the marketplace. And the same is true of Aeronautical Systems Center - we really didn't believe you could improve quality and at the same time save money ... we really didn't understand who the customer was.

Do you remember the shampoo commercial where one person tries the product and likes it so she tells two friends, and they tell two friends, and so on? That's literally how we found out about TQ. Early in 1987, director of our Propulsion Systems Program Office, Jim Hintz, became aware that one of his industry partners, Pratt & Whitney, was engaged in an organizational transformation called "Q+." To help themselves, Pratt and Whitney had hired the Cumberland Group to implement a Total Quality Management culture. They improved ... and we noticed. Our Propulsion SPO followed suit. Then they told two friends. When those SPO directors saw positive results, they recommended that the techniques be adopted by the entire Aeronautical Systems Center.

General Bill Thurman, the commander at the time, committed Aeronautical Systems Center to TQ by hiring the Cumberland Group on a three-year contract to provide training and consultation. Let me tell you, friends, that was no small commitment. Spending millions of dollars to train ten thousand people in a government bureaucracy which has decades of ingrained practices and policies was a major leadership decision! But General Thurman committed himself, the manpower, and the dollars needed to train the work force and put in place a TQ structure.

When General Mike Loh moved from the Vice Commander to Commander of the Aeronautical Systems Center, he committed to keep the TQ process going. Now we had the beginnings ... awareness ... and our people were being educated on how to use the TQ tools and methods. General Loh and the senior leaders of the Aeronautical Systems Center created a common vision of who they were and where they were headed.

In addition, it wasn't enough that the senior leadership was committed to TQ - the entire organization had to commit as well. The Center was involved ... but it was not committed. There is a difference between being involved and being

committed. Like that story about the chicken and the pig and a breakfast of ham and eggs. The chicken is involved but that pig is committed!

Next, we needed enthusiasm and trust from our employees. So ASC developed a vision - a statement about the organization:

"We work together to create quality systems for combat capability to ensure we remain the best Air Force in the world and preserve the American way of life forever."

ASC also needed guidelines to chart a course into the future ... some principles:

- Change the Culture - A Way of Life
- Know and Satisfy Our Customer's Needs
- Delegate Responsibility AND Authority - Accept Accountability
- Give EVERYONE a Stake in the Outcome
- Create a Climate of Pride, Professionalism, Excellence and Trust
- Strive for Continuous Improvement - Make It Better!

Did you listen? A cultural change! Customer. Enable and empower.

It's important to note ... ASC had three leaders during this TQ venture ... each has added to the play book. They created goals to further focus on what ASC should strive to accomplish. So now with the vision, the principles, and the goals combined, ASC had a description of what we were, what we wanted to accomplish, and how we were going to get there. This description provided a framework which allowed all of our ASC organizations to become aligned in their TQ efforts. It also provided a foundation for setting priorities and making decisions for the entire organization.

Then I became the new coach for ASC, inheriting everything from Generals Thurman and Loh. And of course, I accepted the now well-established TQ culture and methodology. Now this is very important! When you change quarterbacks in the middle of the game, you don't throw out the old play book! At every leadership change, the people watched to see if we were serious about TQ ... about those principles. When I came on board, all that was needed were some new plays to further our winning streak. We had a vision of who we were and where we wanted to go, we had principles and goals, but we didn't have adequate measures to indicate our progress.

How do you know if you're accomplishing your objectives if you don't measure? How do you know if you've improved a process if you can't show data on how it operated before? How do you know if you're pleasing the customer? How can you tell if you're better off now than you were before?

So that was my leadership challenge. I added the thought that you can't manage what you can't measure. As Vince Lombardi once said, "If you ain't keeping score, you're only practicing." So we created an aggressive metrics program to measure critical processes as well as to benchmark. But I'd emphasize, we kept on pushing on all the other familiar fundamentals.

And what's the next play for TQ at the Aeronautical Systems Center? Our major challenge now is, believe it or not, waiting for much the rest of the Air Force to catch up. The Air Force has now embraced the concept of Total Quality, but they're just starting out. Air Force Chief of Staff, General Tony McPeak, is steering us to a Quality Air Force, QAF. QAF is "A leadership commitment and an operating style that inspires trust, teamwork, and continuous improvement everywhere in the Air Force." When the Air Force came out with their vision, we at Aeronautical Systems Center adopted it as our very own. As the Air Force comes up with its principals and goals, we at the ASC will adapt. Even as we speak, Headquarters Air Force is considering its own metrics for use across the entire service. We'll pick up on those as well.

My point is this, the environment is constantly changing so no matter how well along the TQ path you are, the leadership challenge is to adapt, but stay focused on process improvement. The Air Force is undergoing the most dramatic changes since we became a separate service after World War II. As we downsize, consolidate, and live with fewer resources, Total Quality has helped us at ASC adapt to these changes. And it will work for the Air Force at large, too!

Jerry Bowels, author of **Beyond Quality**, says that TQ is something that is successful over the long haul. "Most Japanese companies began their quality improvement efforts in the early 1950's and stuck with them religiously, although they didn't begin to see significant payoffs until the late 1970's." It took time folks! That says leaders better have staying power ... they need to put new structure, new methods, in place ... it's a culture change!

I'd leave you with one last thought ... leaders must be enthusiastic about TQ ... Tom Peters might say be zealots ... or the change will not occur. Here's a little thought I really like: Every morning in Africa, a gazelle wakes up. It knows that it's going to have to

run faster than the fastest lion or it will be killed. Every morning a lion wakes up, and it knows that it's going to have to outrun the slowest gazelle or it will starve.

In business, as in nature, we fundamentally understand that only the fastest, the strongest, the smartest will survive. It really doesn't matter whether you're a lion or whether you're a gazelle. When the sun comes up, you had better be running. I think that's exactly what TQ is. It is a decision to run hard every day. I would say that's my concept of what enthusiasm and zealotry really are.

Top Leadership Panel: Dr. Laurie A. Broedling, Associate Administrator for Continual Improvement, NASA Headquarters; Lieutenant General Thomas R. Ferguson, United States Air Force, Commander, Air Force Aeronautical Systems Center; Daniel P. Burnham, President, AlliedSignal Aerospace.

"TQ AT ALLIEDSIGNAL AEROSPACE"

DANIEL P. BURNHAM
President
AlliedSignal Aerospace

Several months ago, Tom asked Laurie if she could arrange it so he wouldn't have to follow an astronaut or a sports figure. I asked if she could make sure I wouldn't follow an Air Force Lieutenant General. And you can see what effect that had!

AlliedSignal is three businesses: Automotive, Engineered Materials and Aerospace. You've heard us as Fram, Autolite, Garrett, Bendix, and, maybe as Allied Chemical. A year and a half ago we experienced a leadership change at the chairman level. Prior to the change we had solid performance. Our customer satisfaction was, by and large, pretty good. Our employee satisfaction was, by and large, pretty good. and our financial performance was, by and large, pretty good.

But was it good enough? Was it good enough to meet our objective of becoming a premiere company, distinctive and successful in all that we do?

What we saw was that the world was speeding up and the future seemed to offer new challenges. Auto sales were flat at best. Housing starts were off. Consumer confidence was weak. Each of those economic indicators is a significant driver to our business.

The air transport original build cycle was peaking and clearly going to be headed down, as we are seeing today. And obviously defense spending was on a downward path.

In light of those conditions we determined that we had no choice but to reinvent ourselves with a focus on customers. We needed, first of all, to define the values for which we as a company of 100,000 people stood. In order to reinvent ourselves around the customer, there had to be a sharing, an encompassing of our employees.

So we laid out a process to define our values -- customer, integrity, people, teamwork, speed, innovation -- all in support of performance. And we set out to position ourselves around this set of shared values.

We could have decided to do this without reference to the experiences of other companies. But with the large organization, we could not afford to stumble. We couldn't afford to fail. Management's most important asset is credibility. Once spent, it's gone. So we looked around and see who had been there? Who had reinvented themselves? It's not hard to find companies that fit the profile: Xerox, Motorola, Ford, Toyota.

But it's not enough to just say they reinvented themselves. What was the core? What was the process those organizations and others used? We believe we knew the answer. It's Total Quality!

TQ became the process we used to drive -- and this is the key word here -- results. I'm going to develop that theme over the course of my talk: results with respect to customer satisfaction, results with respect to employee satisfaction, and results with respect to financial performance.

Of course, Total Quality is not new. In many ways, we had been using TQ in various business units over the prior five or six years. But as I went candidly through some self-assessment, we saw that whatever we were doing wasn't enough. We weren't getting the full measure of expected results. We needed to refine the process and step up the pace.

Before we continue, however, let me give you a quick summary of AlliedSignal Aerospace, where the demand for results and the need to change had become increasingly urgent. We are a company of about 40,000. We are the number one supplier to the aerospace industry. We have 15 separate businesses from engines to avionics, to wheels and brakes. Three-quarters of our sales come from product market segments where we are number one or a strong number two. We have about a half-billion dollars in sales each year to NASA from such programs as the National Reference System, life support, mission control, and facility support through AlliedSignal Technical Services Corporation.

In fact, Technical Services, previously known as Bendix Field Engineering Corporation, has about 3,600 people involved in NASA support at three major sites: here in Pasadena where we have several

hundred people, at Goddard Space Flight Center, and the Johnson Space Center.

We did not compete for the George M. Low Trophy in 1991 and 1992 as we were refocusing our resources on specific results. But we were finalists for the award in the last three times we competed ... in '88, '89, and '90. And we are very proud that we have won the Goddard Space Flight Center Excellence Award. We've also just finished our latest AIA quality audit, and for the third year running we received the highest award ever given by AIA up to that point.

AlliedSignal Aerospace is dedicated to quality, and we have host of experiences in managing TQ. Some of them are good, some are bad. What I want to talk about with you today are the lessons we've learned and the new lessons we learn every day. But I would like to present this material to you as a fellow traveler, not as one who has reached the destination.

First, using the principles of TQ, let's define our terms. Total quality is delighting the customer. That's more difficult than it seems, because in order to delight the customers, you have to anticipate that customer's needs and then be there to respond to them. The problem is that the customers themselves very often neither know their needs nor can articulate that which they do know.

Secondly, it's valuing employees. I chose the word "valuing" for a purpose. Other words or phrases that come to mind are respecting, listening, training as a process, and continuously improving -- which also implies a constant state of rising expectations. Think about what that means.

It means a never-ending impatience. It means an institutional tension because you can't have continuous improvement without a continuous dissatisfaction, impatience or tension.

While it is important to understand what TQ is, so that the rest of my discussion here makes sense to you, we also need to define what TQ is not.

TQ is not comfort. It's not complacency. It's not ease -- certainly not for the middle managers who have to change habits they have developed over the duration of their career. TQ is not just training, and I'm going to talk more about that. TQ is not just a series of projects, although it includes training and a series of projects. TQ is certainly not a buzzword. TQ is not nebulous actions leading to even more nebulous results. It's not just awards, although they are important and are motivators. And TQ is not speeches, even like this one. Most fundamentally, for our view point, TQ is not input.

TQ is the means to output. And it's the means to outstanding results, which lead to more satisfied customers, more satisfied employees, and higher profits. That's what we're all about.

TQ is at the center of our company as we reinvent ourselves. Here are the goals that we show to stakeholders throughout our entire organization; and whether they're shareholders, security analysts, suppliers, customers or employees, we keep the goals straightforward. They're not simple, but they are straightforward:

- Make the numbers. We're going to live up to our commitments.
- Make TQ the foundation of productivity. We've set a goal of 6 percent productivity each year, and that's a challenge. TQ is the foundation of productivity.
- Make growth a part of our commitment to each one of our constituencies. Each of them deserves it, most importantly our employees.

So, TQ is the impetus behind change, which does not happen as a matter of course. Change always must be led. And that's the main point of my talk: leadership and commitment in the TQ environment. It's up to the leaders to create a sense of urgency by creating a vivid awareness in the employee base of where we're going to go if we don't change.

We also have to create a vivid awareness of who our customer is. It may seem obvious to you in this room who your customers are, but we have 40,000 employees, and it's not obvious to each of them who their customers are. And we need to create that awareness personally and in detail. We facilitate that by showing employees the data customers give us. We encourage our customers to come and talk to our employees. And occasionally we also need to take our employees from all levels to the customer.

Leadership creates that sense of urgency, the so-called burning platform, by making the consequences of not changing obvious. Phil Crosby, among others, has been articulate on the study of change. People change when they have to. "Stop smoking or you are going to die," is the way Phil says it. Institutions are people, and institutions change only when they absolutely have no other choice.

As I mentioned before, TQ has been underway in earlier versions at AlliedSignal Aerospace for several years. But only in four divisions, could I say as of 18 months ago, was there real change.

Was it worth it? We trained hundreds of people, and gave hundreds and hundreds of speeches, but most of our operating units had nothing to show for the efforts. There were projects. There were courses.

But was there fundamental change? Were there results?

There was one common thing in those four organizations that did change: they were on the brink. If they didn't change, they wouldn't have made it. It wasn't a particularly higher purpose. It was, in their cases, desperation. So they changed. And if you learn from your failures, then you as a company are highly educated. I thing we learned from our failures.

The lesson learned is simple: Change or fail. Evolutionary change does not meet the rate of change required of our customers today. One of the most dramatic changes in the aerospace industry the last two years is that technology has become a leveler rather than the discriminator. You clearly have strong, dynamic, vital, fully competitive, even state-of-the-art technology. Yet, that alone no longer is good enough.

Delighting the customer every day and then also having the lowest cost is now required. And the "now" cannot be over stressed given the implosion of many of our markets.

Leadership anticipates these requirements and then humanizes them, putting them into the context of what they mean to individuals as employees. And they also have to be put in the context of what they mean to employees when the organization is downsizing by 20, 25 or 30 percent. That is the real world, and we have to manage the TQ revolution even in the face on-going downsizing. No one said it would be easy.

Speed is your friend. It's your competitive weapon. And, if well-managed, speed can knock down all of the institutional barriers that are thrown into your path constantly. So the lesson is to create that sense of urgency.

Here's another lesson. Everybody in the organization, especially those in the lower ranks, already knows what is required for a company to be successful. They're waiting for us. I can't tell you the number of times I've heard employees say to me, "So what took you guys so long?" Or, "It's about time." Or, and I love this, "Why didn't you just ask?" I know every one of you has experienced that in one form or the other.

Another lesson is sharing data. Every one of our employees should know what we are doing, even the embarrassments. Invite specific customers -- even the ones that might be mad at you -- to tell the employees the reasons for their feelings. Tell employees what the customer's data says to you about their satisfaction.

We conducted a complete employee survey recently. We shared the results -- warts and beauty together. I must have received 50 letters from employees who were shocked that we shared news that was not uniformly positive, even though they already were aware of it. I find it surprising they thought we wouldn't share it. Like I said, they already knew it, so why not share?

Show employees your operating metrics, show them the results of the business, and give them the tools to deal with the problems. The tools are critical. Without them, we'll fail. But TQ is not just a set of tools.

At AlliedSignal we have a four-day workshop called Total Quality Leadership. Ninety-thousand people are being trained in about 16 months. As far as we know, it's the most rapid roll out in the industry. I've been through the workshop twice now because I guess they thought I needed it twice as badly as others.

Before I went through the eight days, I spent about another five days with the top management helping design the program. And now that the roll out is in place, we are proud of our curriculum. We think it's powerful. But, as you all know, it's not rocket science. There's no hidden wisdom or magic in it. Everything is fairly fundamental.

One of the strengths in our course is that our training is based on real business issues. Natural teams come in for training with issues that have been defined through a previous process. And the ability to resolve those critical and significant business issues is the result of undergoing the four-day training course. They come out with a preliminary problem statement and a statement of work with interim goals that is signed off by the boss.

Three months later, the results are reviewed by the boss. In another three months -- hopefully, six months is the general range of time -- the team is measured and assessed on solving its problem. So this is training, but in reality is behavioral modification focused around the real-world business issues.

Another lesson learned is to demand breakthrough results. Don't be shy. It's been shown time and again that empowered teams set more aggressive goals in themselves than their managers would. What does that tell you? To me it says demand breakthrough performance.

People ask me what am I doing to further TQ. The first thing I tell them is that I demand outstanding results. That focuses attention. So do the facts, goals and measurement. Measure, measure, measure.

Now all of that is interesting, but what do you do about it? If you buy into all of this, how do you move forward from wherever you are? First, constantly increase your demands. Continuous improvement is a difficult task master.

Don't be patient. You'll get a little bit of discussion here. We were patient earlier with respect to results. And I think we suffered because of it. We don't expect miraculous results coming out of each project, but we are holding the business units to ambitious goals in order to focus attention.

I start every single business meeting with a review, not of numbers -- we get to it at the end -- but of TQ metrics. Every organization has a complete set of metrics that get at a number of issues, including cycle time reduction, employee satisfaction, customer satisfaction, number of suppliers, average quality level on a supplier base, on and on.

We review those results. In each of those metrics, we show not only our history, but world-class goals. Those, in many cases, aren't going to be achieved for two, three or four years; but we still show them. And we continually redefine as we become more knowledgeable about our processes. We broaden our perspective in the external world as we go, and we constantly benchmark on those processes. So, our world-class goals are constantly moving upward.

I conduct every meeting in which it is appropriate using TQ tools. I personally lead three TQ teams. Unless the leader is personally leading the TQ team, I don't think he or she is going to pass the muster with the employees. Of the team on which I'm working, one is a corporate-wide team on career development, another is a team within Aerospace on growth, and the third, again corporate-wide, focuses on integrating technology and strategic planning.

Be visible on TQ and give on-the-spot reward and recognition. For those of you who are in the private sector, if it's achievable, give money, give stock certificates or stock options right on the spot.

You're going to be constantly tested to prove that you believe in TQ. I can't tell you how many times I get asked, "Yes, I know all of this, but do you really believe? Do you really support it?" And it's not so much the words and the way you answer. It's your behavior.

So, from our experiences we've concluded that TQ is not input. TQ most certainly is common sense. TQ is measured by the results of the organization. TQ is a means to the end. It's a means to performance. Thank you very much.

"ORGANIZATIONAL TQM"

WILLIAM K. SCHERKENBACH
Executive Director, Management Quality
General Motors North American Passenger Car

Thank you. Thank you very much. A little warning: This is going to be the longest 20 minutes you've ever spent in your life. It's not just due to the fact that it's after lunch. I'm a statistician. And if you've ever had the privilege of sleeping through a statistics class in the university, you know we have absolutely no sense of humor whatsoever. It's going to be a long 20 minutes.

A couple of years ago a friend of mine said, "Bill, after knowing you all these years, I've finally figured out what a statistician is." He said, "A statistician is a person who likes to work with numbers, but didn't really have the personality to become an accountant." It's downhill from here, from here on.

I'm going to talk about excellence, since the topic is excellence -- the topic of this conference is Excellence: The Journey Continues. I'm going to make some brief comments before I give you something that you can take home with you that I guarantee you will improve the quality of your organization, improving the excellence of your organization.

I'm going to make some brief comments on how change takes place. How improvement takes place. If you look at improvement throughout history, whether you're talking eastern cultures or western cultures, or individual people anywhere in this world, if you're talking about cultural change, political change, scientific change, you'll notice that there is an obvious similarity to the changes that take place in all of these fields, all of these areas.

They don't use the same words, but the concepts are the same. All change takes place on three levels: physical, logical, and emotional levels. The biggest mistake any of us could make in trying to change an organization, trying to help an organization change, is to think that because you're particularly fond of one of those levels that it works for you, that it's going to work for everyone else.

William K. Scherkenbach

I'm going to talk a little bit about the levels. I call them physical, logical, and emotional. Other people have called them different things at different points in time in history, but think of physical, logical, and emotional.

First, the physical level. There are numerous folks who think that all they have to do is give the order and it will be followed out. That is necessary for some. In fact, sufficient for some to change, but absolutely irrelevant to other people.

The policies, the mission statements, absolutely relevant to a number of folks and irrelevant to others. If you're physically oriented when you look at the policies and the procedures and the orders and the commands and the lists and the check sheets, absolutely necessary for some folks, but as I said, irrelevant to others. So if you're physically oriented and you're coming up and you're trying to change an organization, it may work for you to have a mission statement, but don't make the mistake to think that mission statements are going to impact everyone else. They will not.

If you're logically oriented -- this is a meeting of leaders and scientists and explorers and a lot of you folks are logically oriented. You just put the equation on the board, and that's sufficient for a lot of you to change. Absolutely irrelevant to the physical folks. You need to understand why. You need to understand the logic. You need to understand some of the questions. And that's what I'm going to leave with you, because this group is able to handle the logical content of what I'm going to talk about.

You also have the emotional content. People talk about the heart. The hand, the head, and the heart. That's a metaphor that you're all, I'm sure, familiar with. The emotional content is very, very important to some people, and absolutely irrelevant to others. And so when you're looking at how to get things done, you have to look at your people in your organization as your customers. Certain things will work with certain people, and absolutely create the opposite effect in other people.

You cannot do anything on the average. A leader has to be keen, extremely perceptive about what their individual customers need at a particular point in time in their life. What works with one person today, won't work with that same person perhaps tomorrow because we change. That's one of the most important aspects of leadership that I could pass on to you. You need to understand that your plans for change have to include actions on all three of these levels; otherwise, you are missing major constituencies in your organization.

There is not a hierarchy here. You do not go from physical, then to logical, and then to emotional in order to effect change. It's not a series relationship. It's not in sequence. There is no hierarchy. And the best way I've found to portray that is use a ven diagram. You can see the physical, logical, and emotional there. And I'm going to absolutely simplify philosophy for all those who slept through those courses, too.

You can think of the intersection between the physical and logical as science. The intersection between physical and emotional as art. For the intersection between emotional and logical go, to the root of the word "psychology." Logic of the soul. Each of these are very, very important subject matters that you must have expertise in. And in the center, I've got where all of them operate together. I've got harmony.

What eastern cultures would call harmony. What Maslow in the western culture would call peak experiences. This is a very tenuous area where all three of those come together, because slight changes in the combination of physical, logical, and emotional will cause the whole to be far greater than the sum of its parts, and that's what you're looking for. And another slight change might zip it down so that the whole is a lot less than the sum of its parts.

This is greatly oversimplifying the world we live in, but it shows that you can directly change people physically. You can directly change logically, and you can directly change emotionally. There's no series, or prescribed sequence there. And you need to consider that. Your plans for change must include those three levels whether you feel strong at it or not. Whether you think it works for you or not, you have to recognize that it's bigger than you.

Now, I'm going to talk about logic. One of the very important pieces of information that I can give you, and I'll build up this flow, is that the thought that questions are cheap. It's the answers that cost a lot of money. And you as leaders, you as question askers have got to begin to take stock of the questions that you ask.

One of your areas for improvement is to improve your questions. And if you do that, I think you can improve your organization. Now, how do you improve the questions? If you improve the reports that you see, you're going to be able to improve your questions.

On this logical level, it's fairly simple. I've found that with CEO's and presidents and chief operating officers, when I can change the reports that they see, I can pretty much change the questions that they ask. And those questions for those logical people that are in the organization will change immediately. It's an extremely powerful way of proceeding.

Some folks mentioned this morning the importance of measurement. General Motors is in the process these past two years of going from an organization that tried to measure everything and the accompanying staffs that it required to measure everything. In fact, 2,500 measures as the company evolved, as the bureaucracy, as the size grew over the years -- 2,500 measures were reported to headquarters on a daily, weekly, or monthly basis. That is one heck of a lot of measures.

Two years ago, we formed a top-level committee to take a look at the measures, and to see if we could run the company without 2,500 measures and all the people that it took to manage, ask the questions for 2,500 measures, come up with answers for the 2,500 measures, and process them. Thousands of people are required to do that.

Last year the committee said that we should be able to reduce the number of measures from 2,500 down to about 60. The important thing about the measures is if you looked at them individually, they're

particularly unremarkable. Each of you might run your organization or have some of these measures in the organization.

What is important, the important thing I think for you to take back is that if you're going to measure something, you have to recognize that no measure stands alone. There is an interdependent set of measures. You cannot at one point in time say, "knock off overtime" in order to save costs. And at the same time, maybe two weeks later, say, "what happened to schedule?"

Each of the measures, each of the 60 measures, does not stand alone. They are an interdependent network. So if you're going to measure something, you had better put together the process flow diagram that shows that cost and quality and delivery and the greatness of what it is that you're producing, all are interrelated. All are linked together. And that if you affect one or change one, you're going to affect the other.

Now, it's going to be fairly obvious to you systems thinking folks, but at the business level, at the board room level, I assure you that it's not obvious. Each of these people has had a favorite key characteristic that they have used in order to manage an organization. Some people are concerned about the cleanliness of the floor. And if the floor is clean in the plant floor, then they know you've got a good organization there. Neither good nor bad, but you've got to recognize that that is not an independent measure.

Now, for the questions. The first question in a set of six questions is, "Do you really know what it's going to take in order to get your customers to brag about owning your product or service?" Some of the people spoke about that this morning. And it's old hat now.

Ten years ago when we came up with that at Ford, that observation that a lack of a negative doesn't connote a strong positive. That the focus of quality as the elimination of negatives, the elimination of waste, will only get you at most half way there. It's the addition of positives, getting your customers to brag. Getting them to take delight, joy in what you're giving them is absolutely what sells. It's not the avoidance of a negative. It's the addition of positives and values.

So what we have found throughout industry is that your market research probably does a fairly good job at corroborating warranty. Your market research probably does a very good job of keeping track of the negatives, the defects that could be an adverse variance in a budget review. It could be a warranty complaint. It could be a complaint letter. It could be a whole number of negative things. Managing by exception. And if you're managing by exception, you're missing out on a whole new way of really making your organization sing. You manage the system.

In any event, a lack of a negative never has and never will connote a strong positive. The systems and processes you have in place to make sure that there are no problems are not the same ones that you put in place to make sure that there's value. You take away all the waste, and what's left over is not value.

Now, a question each of you can start to ask perhaps this afternoon as you speak to your people. Before you ask any question, whatever the subject matter of it is, ask yourself, "What am I going to do with the answer?" The answer to your question is your incoming material. You have an obligation as a process manager to add value to it and pass it on to your customer. If you cannot see a way to add value, I would suggest strongly that you not ask the question. Rephrase the question. Think it through.

The organization does not -- the folks are not sitting around waiting for you to ask questions. Once you've figured out that you can add value to the question, and you're allowed to change your mind depending on the answer, at least you thought it through, because too many questions are floating around here and there are not enough people to answer them. Again, the questions are cheap. It's the answers that cost a lot of money.

This gets to the third question, "What are you going to postpone or cancel in order to answer this question?" You have just, by your question, reset that person's priorities. And as I said earlier, they're not sitting around waiting for you or at least they shouldn't be sitting around waiting for you to pontificate and ask a question. They are not going to do something or they're going to reprioritize something.

You need to, as a manager, if you can get them to answer this question, you have a golden opportunity to begin to take something off the plate. There are too damn many projects and programs and things that are put on our people's plate, and management is not taking anything off of them.

I addressed a management group last month, and one manager came up afterwards and said, "You know, I recognize that we are filling up the plate, but the solution is give them another plate."

I said, "No, no, that's not my idea of improvement."

You have an opportunity here if you can get this question answered. And it may be that you got fear in the organization and you might not get an honest answer.

You might ask the people to go back and take inventory of what perhaps is falling off the plate, as you ask these questions. And if so, then you've got a golden opportunity to begin to step up to your responsibility to take some of these programs off the plate if you see that they're falling off already and you don't even know it.

A fourth question, an extremely important question. You ask the question, "By what process will you answer my question?" Dr. Deming tells a very simple, homely story. He said, "You cannot clean this table unless I know what you're going to do with it. You cannot ask me to clean that table and I can't clean the table unless I know what you're going to do with that table after I clean it."

As simple a request as that. If you're going to eat off of it, I can look at it, save you a lot of money and dust it off, and it's clean enough to eat on. That's the process I use. You need to understand that if you're going to eat off of this table.

If, on the other hand you're going to do surgery on the table, that's a completely different use for that table. I have to use a different process in order to come up with that answer in order to clean the table. And you had better not do surgery on it unless you understand the process that I used to clean the table. You can get into a lot of trouble.

It may be clean enough to cut people on, but if you're going to do microchip assembly, it's not clean enough to do that. That requires a whole different process to clean the table. And so you really have to understand by what method was this table cleaned, by what method did you go about bringing me this data or these data so that I can use the answer. I need to understand that process, so I know what the strengths are and what the weaknesses are.

You're going to begin to build that pattern, that process flow of who does what and how things get done in a large organization if you begin to ask this question. What you're going to be able to do with the output will be dramatically better as well.

I had implied when we didn't see the big process flow with all the interdependent relationships on the performance measurement and feedback system that General Motors is implementing right now, but I implied a very valuable question. "What are the tradeoffs?"

If you sit down, if you're in the board room, every problem that the board has ever faced and perhaps will face, they have already faced at some point in time, and in solving one problem unfortunately, they've created 20 other problems. Whether it's in the board room, whether it's a shop floor, we have all the time, compartmentalized the solutions.

And when we compartmentalize the solutions or tunnel in on the solutions, we many times create problems for other areas of the company, because we do not look at what we're managing as a system. And so a very quick way, a very powerful question is, "what are the tradeoffs?" You say this will work. What's the down side? What are the tradeoffs?

There are obvious tradeoffs in cost, and quality, and timeliness, and greatness. A very simple question, but absolutely one you need to ask every time you're in discourse.

And, finally, the last question, "Do I know what it's going to take to get my employees to brag, to take joy, to take delight in what's going on?" In one of the few cause and effects relationships that I see anyway, you cannot talk about outside customers being delighted unless you first talk about your people being delighted, bragging about working here, working for you and with you.

What is it that's going to get my employees to take joy in what they do? And this is where Dr. Deming speaks a lot about the appraisal system. About every management process that's in place, that was put in place for a very good reason. We all had very good reasons why we put these management systems in place.

But with different theory, with looking at it from a different perspective, you can see that many of these systems, even though they were well-intentioned, are barriers. They stand in the way of helping our people take joy in working for us and with us. One of the bigger barriers that there is.

This gets you into looking at all the management systems. This gets you away from the shop floor trying to worry about improving those processes. This gets you into the financial management process, the budgeting process, the people processes. All of those processes that are barriers and could be enablers -- just because you remove the barriers, doesn't mean that things are going to go well. Again, the lack of a negative doesn't connote a strong positive. You need to look at changing these systems and putting systems in place where you can't help but encourage each of your people to take joy and take delight in what they're doing.

I had mentioned physical, logical, emotional, and I primarily spoke about the logical aspect.

I want to make a brief comment about teamwork, about an equally compelling side of the human being, two equally compelling sides of the human being if you look at how you're trying to reach people. Certainly, on the physical, logical, and emotional levels, being able to determine where each of your people is in that spectrum. But you have to recognize

that that has to be superimposed on two -- let me see here, I think I have this here. I don't want to make this overly complex.

But on the physical, logical, and emotional levels, in your plans for change, you need to have a push system to get you out of a dependent relationship -- essentially feed me, teach me, love me. When you were first born, you were completely dependent upon your parents. When you went to school, you were completely dependently initially upon your teachers, upon that system. Likewise, at work.

In your plans for change, you need in those three areas, physical, logical, and emotional, on the dependent side tasks, assignments to push your people out of dependency. At the same time, you have to have a pull system that on the other six levels of independence and interdependence. It's on each of these levels, you're looking at ways to strengthen the fact that I do it, I did it, I understand what I did, and I feel darn important about that.

At the same time, I have an equally compelling need to say we did it. I understand how I fit into this process, into this system, and I feel damn proud of being an important part of this family, this team.

You hear a lot of talk about teamwork. And I wanted to sway some of your thinking. We're not talking about everything we're doing now is all team, to the neglect of the important aspect of individual brilliance, individual initiative, individual pride, which western cultures, and especially our country has shown what that sense of individualism can do and will do. We've also seen an equally compelling side in the formal systems of eastern cultures where you're in a culture that if the nail that sticks up is hammered down, that sense of family, that sense of community coming before the individual.

The future that I see in the formal systems, as I call them, is to the company, the organization that can balance that sense of individuality and that sense of teamwork. And believe me, it is a balance. If you can't feel a part of a family in the formal system in this organization, what do we see people doing in the United States. You go to your informal life and look to be a part of a family. You join groups where you can feel a part of a family.

Peter Drucker has said the largest growing sector in the U.S. right now is the volunteer sector. And you see that, because you don't get the sense of family in your work place. If you look at it systems-thinking wise, if you've got to go home to feel a part of a family, then both your work suffers and your home life suffers.

In the far east, what do we see? In the formal systems, it's the team, it's the family, it's the society that's first. In their informal systems, you see them looking for ways to stress that individuality. I don't want to get into sports analogies, but golf. Very, very popular. You couldn't pick a more individualistic sport in this world. You see people in informal settings over there saying this is my idea. I am important as an individual. And they have to go off line to do that.

We have an opportunity, and this is why I feel very good about what's happening over in this country. I see a growing number of people recognizing that we need to balance the individual and that sense of family in the formal organizations. You might try it in your informal life as well.

I do not see that sense of change, that sense of urgency, that perception that the formal systems over in the eastern cultures should be anything but stressing family. I think that we've shown what individual stress or stressing the individual -- take that both ways -- can do. And they've shown us what stressing the team and the family can do. If you're able to find a way to balance them both, I think you're going to blow the doors off of what really can happen in this world.

Many times I'm asked the question, "How long is it going to take?" This question was one of the questions I paraphrased this morning. My answer has been consistent. Over here when I'm asked that question, I say it will take a long time. It's going to take about 20 years. When I'm asked that question over in Japan and in China, I say it won't take long at all. About 20 years. It depends on your perspective.

"RECOGNITION OF THE 1992 LOW TROPHY FINALISTS"

AARON COHEN
Director
Lyndon B. Johnson Space Center

It's really a great pleasure to be with you this evening. Several years ago, when NASA first started its quality enhancement and productivity improvement program under Jim Beggs, I was on a panel at the Marshall Space Flight Center. My panel recommended to Mr. Beggs that we start this award. The award grew, and so it's really an honor for me to be here with you this evening.

I'm sorry I was unable to participate in the opening session this morning, but as most of you know I am wearing two hats these days and that can pose scheduling problems. Last year, as Center Director of the Johnson Space Center, I was host of the Eighth Annual NASA/Contractors Conference in Houston. That was both an honor and a real opportunity to learn. I am sure that the first day of the ninth meeting of the NASA/Contractor team has been just as productive and interesting, and that tomorrow will offer more of the same.

I am confident that each of you will have a significant return in your investment in attending this conference. The road to world-class excellence is not an easy one to travel. It takes time and it takes commitment. It also takes help along the way. Any trip is simpler with a clear road map, but even with the best map, we often must stop and ask directions.

In many ways, that is what you're being able to do during the days of this symposium. Ask your colleagues how they are doing on their trip, and make sure you are still moving in the right direction. World-class excellence is the goal, and this conference is designed to assist you as that journey continues.

As we think about the NASA team and how we must all interact, I believe there are four points that might be helpful. First, we must view NASA as an "extended system" that includes all of our external suppliers, as well as our external customers. We must work to optimize this entire system in order to achieve the benefits we all desire.

Aaron Cohen

Second, we must work cooperatively with our suppliers and our customers to exchange timely and factual information. We must also seek to work together in defining and achieving mutual goals and objectives. The Low Trophy process often helps us in this exchange of information.

Third, we must focus on increased cooperative involvement with all our suppliers early in the planning and design phases. This "upstream" cooperation is absolutely critical in achieving long-term benefits.

Finally, we must realize that it is only through working cooperatively and collaboratively with our suppliers and customers that we can begin to achieve cultural transformation and significant improvement.

As I have noted, we are here in Pasadena to learn, but we are also here to celebrate. All the management experts agree that celebration is an

important part of any continuous improvement approach. And, tonight we recognize the achievements of eight organizations that have demonstrated a level of excellence that marks them as Low Trophy Finalists. These companies have made it clear that they desire to be world-class and are moving steadily toward that goal.

They have not only made the commitment to improve, but they have demonstrated the courage to be measured on their progress. Each one of them has submitted an application that gives a detailed, self-evaluation of their improvement efforts. Our evaluation team, composed of representatives from Headquarters and all the NASA Centers, have found these eight companies to be well on the road to world-class excellence.

It is now my distinct honor and pleasure to present to each of the 1992 George M. Low Trophy Finalists a plaque that recognizes their achievement. Each plaque is well-deserved. And I ask you to join me as we celebrate this milestone.

Pictured from left to right: Col. John Blaha, NASA Astronaut; Dr. Laurie A. Broedling, NASA Headquarters; Aaron Cohen; Johnson Space Center; Donald Morrisey, Rocket Research Company, Olin Corporation; John Munson, Space Systems Operation, Paramax Corporation; George Faenza, Kennedy Space Center Division; McDonnell Douglas Space Systems Company; Anthony Macina, IBM Federal Systems Company - Houston; Carl L. Vignali, Space Systems Group, Honeywell Inc; Thomas Thies, Cray Research, Inc.; Rebecca Caldwell, Technical Analysis, Inc.; John Schwartz, Systems Engineering Division, Stanford Telecommunications, Inc.

"RECOGNITION OF THE 1992 LOW TROPHY FINALISTS"

DR. A. H. (JACK) WEST
President-Elect, American Society for Quality Control and Manager, Internal Assessment, Westinghouse Electronic Systems

It feels very special to be here this evening. I've always admired the community of NASA contractors and the fantastic achievements of the NASA people.

As President-Elect of ASQC, I get to talk to a lot of groups who are practicing quality improvement. I can tell you that none of them gives me more personal or professional pride than being here with you. The George M. Low Trophy has come to symbolize the dedication of the entire aerospace industry and their commitment to the quality, productivity and innovation. Those are features of our competitive distinction.

It is an unwavering dedication to quality that has kept the aerospace industry at the forefront of quality, and thus the undisputed leader in American industry. However, as I'm sure you all know, our position is under attack and maintaining that preeminence is a major challenge facing each one of us in the aerospace business.

Organizations such as yours have clearly been leaders. You've exemplified and accelerated the improvement process through a dedication to excellence that's been the hallmark of the George M. Low Trophy.

As the first national quality award to be presented in this country, the George M. Low Trophy has led by demonstrating the importance of quality and excellence, as strategic, national imperatives. This award communicates to the whole world your unwavering commitment to those tenants.

The success of the award program can be seen by the phenomenal attendance we have here this evening and all through the community of NASA contractors. As you have demonstrated, just the act of applying for the award, the self-assessment that you go through in the examination process, demonstrates both a sense of personal and professional pride that's unmatched.

In the broadest sense, this award benefits the nation, because it allows us to use all the things that we learn about quality improvement throughout the aerospace community and helps each of us learn from one another. That's one of the most important aspects of any award process, because those benefits accrue not just to the people who have won the award, but to the entire aerospace community. That is one of the reasons why the ASQC has been very proud to be a part of this, because one of our fundamental tenets is being able to share quality technologies across various industries.

The ASQC has been privileged to serve as the administrator of this award since its inception. In those years, many of you have come to us and expressed how helpful it's been to go through the application process and to be able to provide feedback to your own people on what you've learned. That's helped to rededicate the work force's commitment to excellence and to improve the productivity and quality of your products.

Excellence just carries forward, because it requires setting high standards, high goals, and then measuring performance, achieving the results, and, of course, repeating that Total Quality process. Because of those efforts and commitments, Total Quality in the aerospace industry has become vastly more than a buzz word. It's a movement ... sweeping the country, and it's a mind set. It's also a culture that we all hear about so much. Total Quality becomes a corporate philosophy, and more important, it becomes the way we live.

I believe the next thing that will happen in the quality movement is for quality to become part of our personal habits, an integral aspect of our internal human processes where everyday we want to improve everything that we do. The ASQC is a major proponent of that mind set and that behavior as personal improvement becomes a part of the Total Quality culture.

We're proud to have played a role in the development of the NASA award. The Low Trophy is a very significant award. We're all proud of what you've done. Again, the importance of the award just can't be overstated. Its most important facet is promoting

quality and the advances that come with it and sharing with the rest of the community.

My congratulations, and best wishes to all of you.

"ANNOUNCEMENT OF 1992 LOW TROPHY RECIPIENTS"

AARON COHEN
Director
Lyndon B. Johnson Space Center

The Low Trophy is the tangible symbol of a dream. Not only the dream of receiving an award, but the dream of being the very best that an organization can be.

The Low Trophy stands for quality and excellence. In the words of George Low, its namesake, "It is only people who bring quality to things that must work." This award program was initiated in 1984 and was renamed in honor of George M. Low in 1990. It is the most coveted productivity and quality award in the aerospace industry, and we are proud that the standards are high and the competition is rigorous.

We think such standards are befitting of the memory of George Low, one of the most respected leaders in NASA's long and distinguished history. I used to work for George Low, and I think by telling you a little bit about him it might be possible to convey just how deeply we at NASA feel about this award.

George Low is a personal hero of mine, and he was fantastic boss and a good friend. When we worked together on Apollo together, I was chief of the systems engineering on the Apollo Program and he was managing the entire program. He taught me a great deal about management, about the importance of making timely decisions, and about the need to trust the capabilities of our people and our techniques. He showed us all how to be bold.

It was George Low who, in the summer of 1968, made what is still probably the boldest decision of a manned space flight program. Faced with delays in the lunar module schedule, George was watching the clock hands sweep ever closer to the end of the decade, the deadline for meeting President Kennedy's goal of a first lunar landing.

After Apollo 7, the first manned flight of the command module, the plan was to test the lunar module. But George knew we couldn't afford to wait the extra months required to ready the space craft, and after careful thought he proposed a singular journey. It was George Low's idea to send the Apollo 8 crew to the moon on the first lunar circumnavigation using the command module only. It was to be the first manned flight of the Marshall Space Flight Center Saturn V, and it would be the first time that humans would slip the bonds of earth's gravitational influence.

That epic journey was successful on two levels. Technically, it allowed us to prove our concepts, our hardware, and our techniques. But in a larger sense, it also allowed us to galvanize the program and leap beyond adversity to achievement.

It was Apollo 8, perhaps more than any other single event, that allowed us to reach the moon by the end of the decade. Yes, we certainly do honor the memory of George M. Low at NASA.

When organizations achieve great things, we must remember that it was people who made the things work. Tonight, we must remember that it was individuals who made the recipient companies what they are today.

Before making the announcement that all know you all are waiting to hear, I want to make the point once again that the Low Trophy process is not a competition between organizations. It is a competition against a standard. The criteria for the Low Trophy set a standard against which each applicant and finalist is measured. When this measure is applied, the best of the best are selected as recipients.

This means to me that there are not winners and losers. There are only winners. Every company has won, because they have continuously improved and

have the potential to improve even more in the future. Everyone recognized tonight has set very high goals for themselves, and in most cases, have achieved them. We applaud their effort and encourage them to continue.

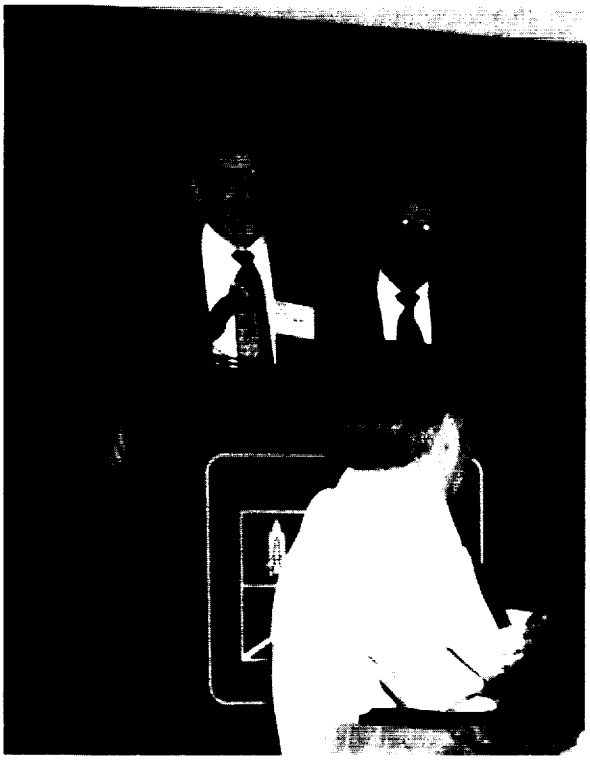
I am now very pleased and proud to announce the two 1992 recipients for the George M. Low Trophy. The first recipient is the Space and Strategic Systems Operation of Honeywell Incorporated. We have already heard how Honeywell plays an important role in each launch of the Space Shuttle. I can assure you that space flight simply would not be possible without Honeywell's contribution to the team.

It also seems important to note that Honeywell has been persistent in their improvement efforts. This is the third time that Honeywell has been a Low Trophy Finalist. I'm pleased to announce they are now a recipient.

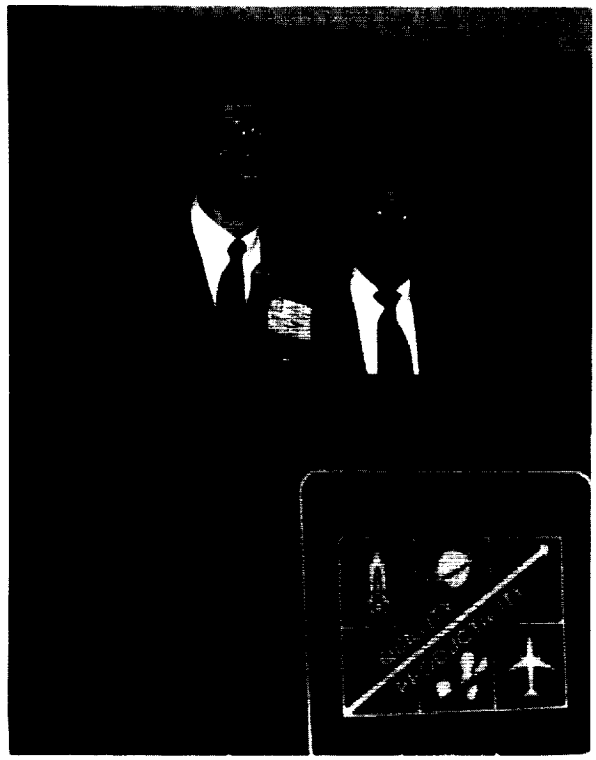
The second recipient is IBM Federal Systems Company of Houston.The selection of IBM marks many firsts for the George M. Low Trophy Program. Known in 1987 as IBM Federal Systems Division, this organization was one of the first two recipients of the NASA Excellence Award for Quality and Productivity. Since then, the award has been renamed the George M. Low Trophy, and IBM has also changed its name.

IBM Federal Systems Company becomes the first recipient to reapply for the quality and excellence award, the first former recipient to be selected as a finalist, and now the first repeat recipient of the award.

I want to assure you that IBM was not selected on its past record, but on its current performance. Our evaluators saw continual improvement from the 1987 level and many new and exciting programs implemented since that time. This company simply does a super job of managing the staggering information systems needed to support space flight.



Carl L. Vignali, Space Systems Group, Honeywell Inc.



Anthony Macina, IBM Federal Systems Company - Houston

"THE CHANGING FACE OF AEROSPACE CONTRACTING"

BRIGADIER GENERAL JEAN E. KLICK, USAF
United States Air Force, Commander
Defense Contract Management District West

I am glad to be here, because I think this is probably the one of the largest group of people that effect my job. I believe my 5,000 people effect all of your lives in your jobs.

Today I intend to talk a little about my organization. Two years ago the Department of Defense consolidated all of the contract administration functions into one Contract Management Command under the Defense Logistics Agency. Prior to that we had a lot of different people with a lot of different rules in your plants. We had Air Force, Navy, Army plant reps, and a Defense Contract Administration. It was not very efficient. We got a lot of gripes from the field, because the rules were different, the paperwork was different, and the objectives were different.

As a result, we made a Defense Management Review Decision to consolidate all the contract administration positions into one command. I command the Western District, which has the eight western states, plus Hawaii and Alaska. Over a year ago, when I took command we had more than 100,000 contracts to administer with a face value of over $300 billion. I had about 5,300 people to do the job.

When I speak with corporate CEO's, they always talk about downsizing, and invariably ask why the government does not follow suit. Well, that's not true in contract management! In the 15 months I've been there, we've gone from around 5,300 people to 4,300, and our target for next year is 3,800.

Our contract value and contract numbers have gone down. In fact of government contracts in the western part of the United States, we have lost 1 percent of face value of contracts per month for over the past 30 months. During the last three years, we've lost almost a third of the contracts or the contract value at any rate. That affects you; it affects me.

One of the things that we have to do to meet the challenge to turn a contract into useable hardware is to determine better ways of doing business. How we're going to work with the contractors, the program officers, and the ultimate customer. What we've tried to do is to make a team.

Before I came here, I was in the procurement side of the business. We worked the satellites for the United States Air Force. We worked both with the contract administration people and the contractors. You might recall, not very long ago there was a lot of money, programs, and growth in the industry. That's certainly not the case now.

Our job is to build teamwork between the contractor, our business, program people and offices, and you the ultimate user. In this case, people like NASA, the Air Force, Navy, and the Army.

I have an interesting command, because we have considerable space business. I know there's been some concern about the competition between the United States government, the United States military, and NASA. I imagine you have discussed that during your meetings here for last couple of days. I deal with not only the military side, but the NASA side as well. I believe you recognize that those plants have representative offices from the Western District. We have several big programs, not just space.

Some of the bigger programs include a good part of the F-22, the Air Force's Advanced Fighter. In addition, we administer the Apache and the Apache Longbow down in Mesa. We also handle the C-17 in Long Beach, the D5 Missile for the Navy, as well as the Bradley Fighting Vehicle up in San Jose. We have a varied number of contractors, a diverse number of customers.

What do we do about that? Let me tell you a little about my job, because sometimes there is a misconception of what we do for a living. It's really pretty simple. We assure that the contractor complies with cost, delivery, technical, quality, and other terms of the contract. It's our people who interface between your program officers and the contractor.

We accept the products and services on behalf of the government. Primarily, it's my people who sign the DD250's. Additionally, we inspect the products before they get into the user's hands. One of the latest things we're doing is getting into program and technical support.

Until my command came into being, we were strictly an administrative organization. In the last two years, we have tried very hard to beef up our engineering staff to enable us to provide engineering and technical support to the program officers. This permits us to tell program officers what is going to happen to their programs before it actually takes place.

We're trying to step from our historical role of explaining cost overruns and why things went wrong to a proactive role which anticipates problems coming up on the scope. From the contractor's perspective, probably the most important role we perform is we act as the paying agent for the DOD ... we're the people who authorize payments on contracts.

What are we trying to accomplish in the Western District, and throughout Defense Contract Management Command and Defense Logistics Agency? How do we meet your business needs? The first thing is our focus on the customers. I recall when I was in Systems Command I didn't believe very many people were interested in helping me. It was bad enough when the Congress went one way, and our operational commanders wanted to go another. Concurrently, it always appeared that contractors wanted to go some place else! No one was asking me what I needed.

We sent out focus teams. I realize a number of you are tired of people visiting and asking what your requirements are, what you need, and how can we serve you better. Instead of sending out questionnaires, we sent a team.

For a month, a team of five individuals went throughout the country to do face-to-face analysis of what we needed to get your job done. We gathered information and we're now working it into metrics. This will allow us to grade ourselves against the criteria you've set.

I'm trying to tell you, if you're a contractor, the things we are expecting you to produce are the very same things the program offices want you to produce. You should view government as an entity. We should be telling you the same things. We should be a hand in glove with the program offices. We hope this cuts some of the confusion that occurred when two different people told you what to do based on two different sets of requirements.

As I alluded to earlier, we're trying to build teamwork. Whenever possible, the program offices and contract administration people meet together with the contractor. This assures we all know the mission, the objectives, and the individual pieces of action.

Now, when you go to program office meeting and encounter someone, usually in uniform, who is not from the program office it's probably one of my people. We think that's important. We want to be an honest broker for each. We do not want to give bad or different sets of information.

One of the areas that we're closely observing is quality. We absolutely believe in TQM, Total Quality Management. We're unequivocally committed to it, as is the is the rest of the government, the other services, and most of industry now.

It isn't easy for us to change in the government, as I'm sure you're all aware. However, I can assure you that the old system of appearing to be adversaries is over. That is definitely the situation in my command, and within DLA. Our goal is to work with our customers for quality programs.

If we serve our customer and obtain quality programs, we've done our job. What we want to do is work smarter to ensure quality. One of our concerns is the old idea of inspecting in quality, which has been a mainstay of the government for many, many years. We're trying to get away from that. When I was the Inspector General for Air Force Systems Command, it was definitely proved to me over and over again that you can't take a historical document, look back, and inspect in what should have been done in the process.

In DLA, in DCMC, we are pushing a program called IQUE, In-Plant Quality Evaluation. This is where we spend time when we help the contractors on the processes of quality. We want to look at how the product is being built. Very tight tolerances. Very close tolerances. Very realistic tolerances. If we achieve these in processing and manufacturing, we will not have to rely on government inspections. We hope this system will work in all of our companies.

I feel the corporations are much more open to this than NASA has been. NASA, just like the Air Force and the other military organizations, has its chieftains and war lords. Although, we are getting a lot of cooperation from some of NASA divisions to work the process as well as the inspections in the final product. We've been trying to work with NASA Headquarters through their Safety and Mission Quality Office, the quality people, as well as the operations people, to make sure that we're looking at the right things. We are trying to design the

processes, put metrics into the process, use statistical analysis to ensure we're making the product correctly instead of waiting for an inspection station.

I have one plea, it's for the government ... and that's not only NASA but my service and the others ... to move away from inspecting in quality to designing quality processes. I believe we're working very hard on that. I am certainly not trying to single out or poke NASA in the eye, though we do have some problems with some of the divisions, but we do need to move that way.

That is not to say that we don't need inspections or that we are not going to do any inspections. I merely contend that we can do fewer inspections of the product, if we do more statistical analysis of our processes. That is the direction we wish to pursue in the future.

Process-oriented contract administration is another area of quality that we totally believe in and feel is part of TQM. We want the contractor and the government to be a team. We would like to study the processes that you use in your factories and manufacturing shops, so we can decide together which processes are important, and what the metrics should be. We would like you to measure your processes, and let us monitor it.

I would like to be able to use my dwindling resources on what's important to both me and the customer. I want to be able to monitor processes. I want to be able to look at data and statistical analysis to determine whether we're getting the product to the company, to the corporations, and from the corporations to our program managers. The companies need to do that.

I believe we've had way too much government direction in the past. We have stopped a lot of initiatives, and made it difficult to make changes. It is a great time to begin since all of us in this country are looking at quality as the number one objective in American industry. We want to allow you to make those kinds of decisions, to design processes that work, and let us monitor them. We would like to work with you to either fix the processes or help you establish new ones.

To summarize, a lot has been changed in contract administration. I can promise you that we are trying to transform contract administration in the western area of the United States, as are my counterparts nation-wide. If you and your companies, as customers, determine that we are not doing that, give me a call. I want to know about it. I want to be able to change it.

My goal and the goal of my District is close teamwork to cut costs and achieve the best possible quality for the American taxpayer. We can do that without a lot of corporation bashing. We must move away from two and three government institutions doing the same job, and working with more than one set of directions.

My intention is to have one American production team for quality products in space and military hardware. We're trying to be an honest broker between the program offices and the contractors. I expect my people to take the initiative and set up cross-feed networks that can use proven methods throughout government contracting. Although, there will be fewer dollars, people, and programs, together, we can make it happen.

"THE JOURNEY CONTINUES"

BILL A. JACKSON
Vice President, Alliance Management Department
Bechtel Corporation

It's a real honor and a pleasure to be here today with NASA and your contractors. You are taking a very proactive leadership role in Total Quality Management. In many ways, you are doing more and better than the private sector. I will talk a little bit about that today.

I think the term, "The Journey Continues," is absolutely appropriate. You are beginning to "walk the talk." As I looked through your agenda today coming down on the airplane, I saw words like leadership, empowerment, and partnering. These are all things that are super critical to an effective Total Quality Management initiative.

Our world is changing very rapidly. What was ain't, and what is, won't be for long! Innovation will be the key to improvement in our world competitive position in the future. I think in the government sector and in NASA, you have opportunities to be innovative and creative, and there is a difference between the two.

Sometimes in your organizations and ours, we tend to see more barriers to creativity, innovation, then there really are. I would encourage you as you take this journey to be as innovative as possible in your work processes and the elimination of waste.

As I considered what I wanted to say at this conference, I decided to talk about the changing buyer/seller relationships, and give you an overview of some results of a recent Private Sector Council study done for the Department of Defense. Additionally, I would like to share with you some trends developing in the private sector. I believe it is important to discuss the changing buyer/seller relationship for just a few minutes. I want to talk to you from the heart, because I think this is an issue of cultural change. It is something that you have to believe in to make happen.

Two months ago, I had an opportunity to visit with about 25 delegates from the former Soviet Union. These were businessmen and government officials. They were here in the United States to sell their assets and their resources. They wanted to sell 51 percent of their refineries and chemical plants. So, they met with several executives from San Francisco from the banking and the construction industries to talk about investing in the Soviet Union.

Bill A. Jackson

We spent the afternoon and into the night, at lunch and dinner, discussing working relationships with the Soviets. So, when you say, "what was ain't, and what is, won't be for long", that is a perfect example. Who would have believed two, three years ago that a boy from Northeast Texas would be having meetings with the folks from the Soviet Union?

They asked at the end of dinner if I would make a few comments about my perceptions of how the meeting had gone. I did not have a prepared text. As I walked to the front of the room, I thought about what I would like to say to that group of 25 Soviets. I related to them that as a kid growing up in Northeast Texas, we lived in continual fear because the world powers were poised for confrontation. We worried about nuclear holocaust and destruction. Today the super powers are poised for cooperation. We must learn to trust each other and share our resources and technology.

We must get the politicians out of our way, because they don't add much value to the process and more often add barriers to it. (I know you don't have politicians to deal with!)

I noted that the real peace dividend was in that room where the American businessmen were talking to the former Soviet Union businessmen about cooperation. The peace dividend is not how much less we can spend on defense or give away in the welfare system. It is investing in our markets and investing in our world economy. The peace dividend was in that room. I said we cannot afford to go back to where we were. Some would have us do it, but we cannot afford to have that happen.

When I finished my talk, a Soviet official wanted to make some follow-on comments. He went to the front of the room, and through a translator, began to talk about trust. One of his colleagues next to me, who could speak English, turned to me and said, "that is an amazing transformation."

So, I guess we can all change. You might ask, what is the relationship between the story I just told you about the Soviets and the buyer/seller relationship? For the 18 years I have been associated in our industry with procurement, we have had an adversarial relationship between buyers and sellers. We have been poised for confrontation. As a result, we've wasted a tremendous amount of our time, money, and effort, because we simply do not trust each other.

Today through TQM, we're poised for cooperation, much like the Americans and the Soviets. In buyer/seller relationships, we must learn to trust each other, share our resources, our technology, and our people. We must eliminate the waste in our work processes through joint improvement efforts. We must get the lawyers, the politicians, and the non-committed to TQM either out of the way or on board to help us win.

The real peace dividend between the buyer/seller relationship is in this room today with NASA and your contractors. We can't lose that peace dividend in this relationship. We cannot go back to a management getting out the wash mentality: a 9/1 attitude of Attila the Hun. We simply cannot afford that kind of leadership in the future.

Total Quality Management is not complex. I think at times, we try to make it that way. It is simply continually improving everything you do everyday forever, and knowing that the changes you have made are working. We have to help our people, and we must turn our people lose to help us. This will require a new leadership, but that leadership is in this room.

As I look around the industry and examine what companies are doing in continuous improvement and Total Quality Management, too often I find a cotton candy approach to leadership. Do you know what the cotton candy approach to leadership is? When I was 10 or 12 years old, I used to go to the Dallas fair. The highlight of that trip was to visit the cotton candy machine. I don't know how many of you have eaten cotton candy, but it's not very filling. You can eat it all day because it is nothing but air and sugar.

Too often our quality management approaches are cotton candy. They're air and sugar, and, at the end of the day, we get sick! I see too much of that in the industry. We cannot go back to that kind of mentality.

Let me share with you a couple of other points, and, by the way, I speak my mind when it comes to quality management. I believe we must be critical of ourselves before we can improve. We have many managers in our company, and there may be some in this room today or in your organization, who are quickly spreading blood on their door, hoping the angel of Deming will pass. They hope that this thing called quality management is not for real, and we can get back to making bottom line decisions. That is not going to happen.

At a conference in Washington, I made the comment that not everyone was on board in our company. They are probably not in yours either, but I hope you are starting the process. There are people who work for me who are on the 20 yard line. There are others who are on the goal line trying to get on the field. There are some trying to climb the goal post while others are on the sideline sitting on the bench. There is another group in the locker room trying to find their shoes. Then there are those who are in their cars trying to find the stadium, while some are at home watching the game on TV. Finally, there are a whole lot of folks that don't know there is a game going on! What we must do is get this team pulled together so we can win.

I listened to a speaker recently who is chairman and chief executive officer of Basic American Foods. He made an interesting comment. He said that after five years of TQM he asked his managers if they felt they were pushing it hard enough. They replied, "Yea, boss. We're really pushing it hard. Look at all the charts? We've sent all our people through training: the critical masses have been educated. We're right on track." He then asked them how many people had quit because they had to work under a new system. The answer was that no one had quit. His response was that he would believe the system was being pushed hard enough when the first person quit!

Total Quality Management is not optional. It should not be. We will not tolerate people coming to work late in the morning, or shoddy performance, or drinking on the job. Why should we tolerate people not working in this new system? It is not an optional issue.

About six months ago, on an airplane trip from Houston to San Francisco I found the first executive who quit because he had to work with Total Quality Management. It is not necessary to mention the company, but they are in the aerospace business. I asked him about his job, and remarked that his company was way ahead in TQM. His response was, "I know that, and I'm quitting." I asked him why he was quitting. He said, "I'm 52 years old and I can't stand that stuff, and I'm not going to work with Total Quality Management." My hat goes off to Harris Corporation for pushing Total Quality Management to that level! (I did mention the name.)

Not long ago, I was on a panel with one of the leading senators in our country. I don't know why he's leading, but he is! Among the comments he made to that group was that as a nation we must learn to die with dignity. I do not think dying with dignity is the issue. We have led the industrial world for 50 years. I am convinced that Total Quality Management will, and is, putting us in a world competitive posture for another 50 years. I believe that is the issue.

I found some recent data in our engineering construction industry showing that the man-hour cost in Europe was $102 versus $56 in the United States. Isn't that is a good indicator of what has happened over the last five or six years as we began to get involved in quality management and productivity? We have driven our costs down, become more productive, and eliminated waste in the system. Concurrently, European costs have gone up. We do not need trade legislation. We need competition, because people like you are poised for it. That is what will cause us to win in the future. I still hear people say that we are behind the world in productivity and quality. That is simply not true. We still have the best American work force in the world, and quality management is the vehicle that will help us win in the future.

I would like to speak for just a minute about the Private Sector Council study, and some conclusions that we reached. Ten companies participated in that study; Hammertech, Bell South, Boeing, Florida Power and Light, Ford Motor Company, Kraft, United Technologies, Westinghouse Electric, Xerox, and Corrospectal Corporation.

The study objectives were to identify best practices in industry. As you know, quality management should allow you to share best practices, not only within your company, but externally. We wanted to see how companies were factoring performance, dealing with process quality, customer satisfaction, and product quality. In addition, we looked for trends in Total Quality Management, and whether there were any legal or regulatory boundaries being encountered.

Until about four years ago, when I put the private sector under a Total Quality Management microscope, I believed that the government sector had more waste than the private sector. Today, I'm convinced there is more waste in the private sector. We have to work to eliminate that.

A key conclusion in the study on the buyer/seller relationship was that relationships were becoming less adversarial. In addition, we found that people were not building on their past failures, and that goals and objectives were very similar. You know, once you put a supplier, a contractor, and an owner together and start talking about what is important, you suddenly realize that we agree. Why have we been so adversarial for the last 20 or 25 years?

I had an opportunity to visit with a dozen labor leaders. It has always been pretty much a fact that labor and management can never get together, because they do not have the same objectives and mission. We spent a day with 12 prominent labor leaders. At the end of the day we had a common mission and a vision statement to move forward in a partnering relationship. Today, our company has signed the first quality partnership with a national labor union in the history of this country. I think that proves that labor and management can come together.

Why can't the buyer and seller come together in a relationship of mutual trust? We found that there is more sharing of information, resources, and technology when they do. Further, the buyers and sellers are able to assess risk better. Risk is the unknown. When you lay all your cards on the table, you can minimize risk in your transaction. So, why do we continue to hide things from each other?

The other day, I had a client on a $400 million project share with me the details of their selection criteria, point system, and how they planned to evaluate our proposal to the nth degree. This was a first in our industry!

As you know, clients will neither tell you what they are looking for nor the value or the weight they are going to give to it. So, what do we do as contractors? We try to guess what they want. Why not open it up, and honestly share this kind of information? That way, as an owner, you will elicit the kind of response that meets your requirements on a less costly basis.

We also encountered a move toward a reduced supplier base, and this is somewhat controversial. One contractor indicated they were going from 5,000 to 200. I think the message here is they were beginning to focus on some major suppliers in their partnering relationship.

Another big focus was eliminating waste in the process. I would like to comment on what William Conway has to say about waste. He notes that during a 40 hour week, American industry only spends 20 percent of its time working things that add value to the product or service produced. That is pretty bad. He believes the other 80 percent is either producing work the system needs, or no one needs, or reworking the work, or simply waiting around for something to do. In other words, doing work that adds no value. What would happen if we increased that time from 20 to 40 percent? I think we see in the industry today a focus on adding value to the products and service we produce.

Another trend that came out of the report was total costs, and time to market focus with a redefinition of quality. We also found more upstream involvement. Suppliers and contractors becoming involved much earlier in the process than historically has been true. Examples of this are bringing suppliers in to help write specifications in the bid request (heaven forbid!); sharing emerging technologies; building stronger, more candid relationships; and developing safe zones between suppliers and contractors. Finally, we see long-term relationships evolving based on trust and "win-win" relationships.

In addition, we observed joint training such as you are having here today. This is what it's all about. We have held two conferences like this for about 500 suppliers. This is the kind of approach you need to get this message out to the community. Many of you are going to walk away from here today, and, if you were not involved in Total Quality Management, you will be.

In another area, procurement, we saw automation improving and policies and practices changing. It is amazing how many policies and procedures you can change. In the past, we tended not to question policy or procedure. They were accepted barriers we would not go around, that notion is changing throughout the industry.

The evaluation and selection process is also changing. Pre-qualified bidders are rated and ranked by agreed-to criteria. Empowered integrated selection teams are used to make the decisions. For example, we are making a presentation today in London for a major project in Russia. A team composed of the client's lower and middle managers is listening to the presentation. They will, along with their partners, make the decision regarding who wins that work. The decision will not be made by the chairman of this company. It will be made by the team empowered to make the decision.

Our presentation does not include any pricing or commercial terms. The award will be made without any. The entire award for this major project will be made based on trust, an integrated team, and Total Quality Management. I believe that is a real compliment to the organization that they have taken this step forward.

We also encountered joint buyer/seller problem solving teams. The industry has learned that work processes do not stop at the front door. Although for 90 years we believed that we owned the process, we now realize that 50 percent of the job is controlled by the suppliers. We have started, as has the industry, to include suppliers as an integrated member of the team to help solve problems, eliminate waste, reduce time to market, and produce a better quality product.

There are proactive problem-solving teams at work in the industry resulting in other benefits such as proactive vendor oversight and reduction in inspection. We see a trend toward inspection becoming the responsibility of the seller, not the buyer. The industry is beginning to view inspection as a waste issue, one of duplication and a rework.

Beside open sharing of information, we observed other trends. Quality management considerations are reported to be 60 to 70 percent of bid evaluation criteria. In addition, supplier rating systems are emerging along with new automation technology.

With respect to product performance and avoided costs, we see the industry moving away from the low unit price driven selection. However, it's still here today. Many companies continue to make decisions based on unit price, rather than total cost. In a procurement session, I told 300 purchasing agents that if I wanted to buy on a unit price basis, I could find a monkey to do their work. Just train the monkey to pick the lowest price per line item, and highlight it with a yellow pen! I did not need them to do that. I urged these buyers to look beyond the unit price and at the value of the products and services they were buying. That mentality is slow to change.

In all, we are making progress. We see more core groups of certified suppliers, a shared commitment to quality management, and an alignment between the suppliers and the owners aimed at reducing waste and adding value.

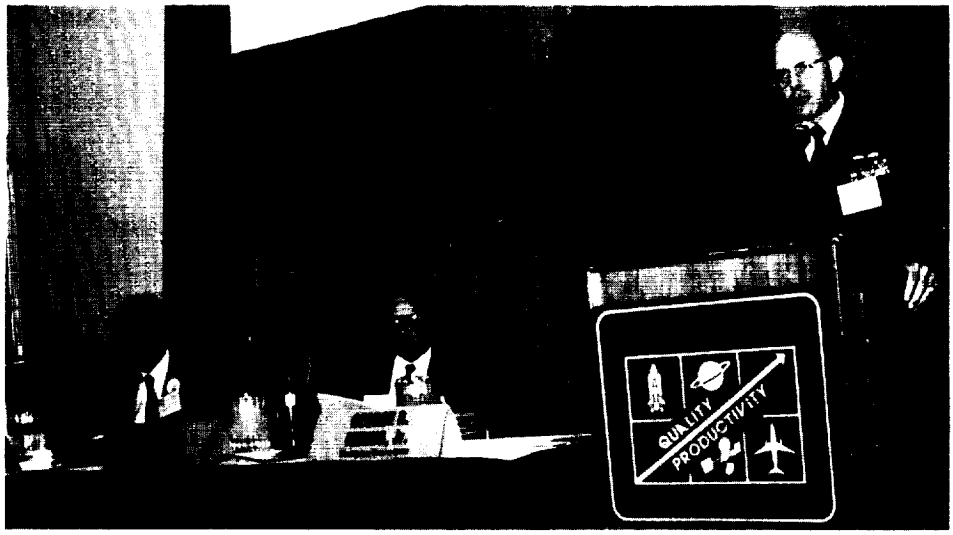
In conclusion, I would like to remind you of what I said when I began, "what was ain't, and what is, won't be for long." I encourage you to have the strength to be innovative and creative. You have fantastic

opportunities in NASA, all you have to do is make the change. I encourage you, as managers, to protect the people in the new system from the people in the old. You must because you are going to have folks in your organization who want to go back to dictatorial management, and we simply cannot afford it. Take a leadership role in the buyer/seller relationship: be poised for cooperation. As Dr. Deming says, there is 30 to 35 percent waste in the system and undoubtedly that is true. You have to believe in it and you have to be committed to changing it.

Conference Photos

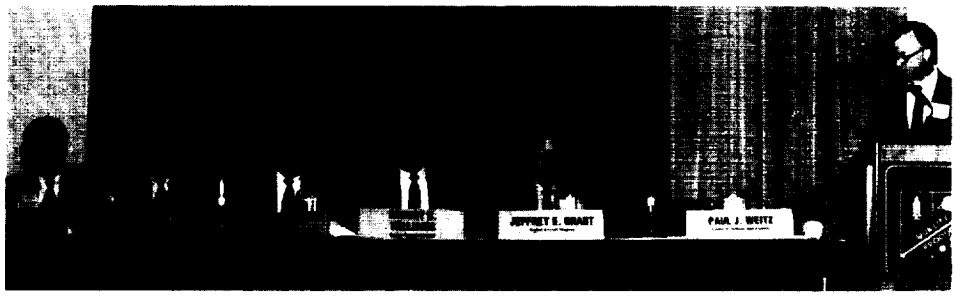
Col. John Blaha, NASA Astronaut

Larry Dumas, Associate Director, Jet Propulsion Laboratory



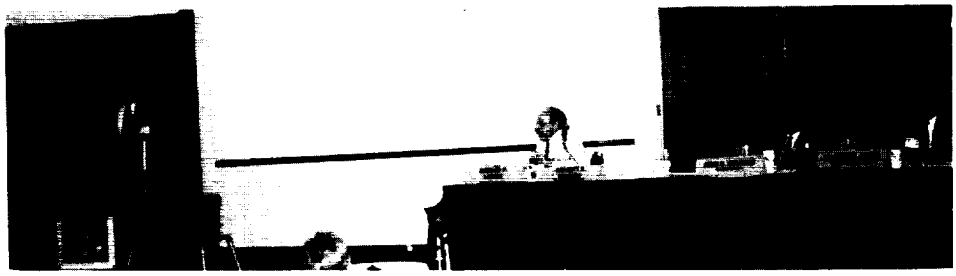
Leadership Versus Management

Small Business Successes



Transforming the Management Team

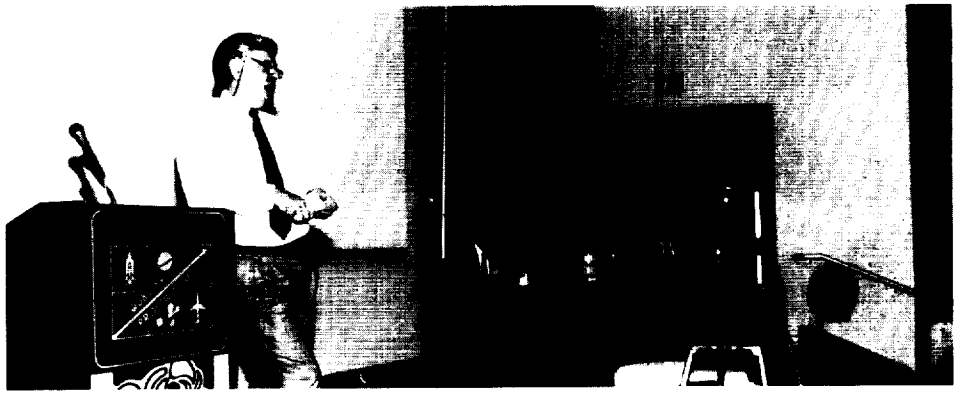
Education Success Stories



Capturing Customer Satisfaction

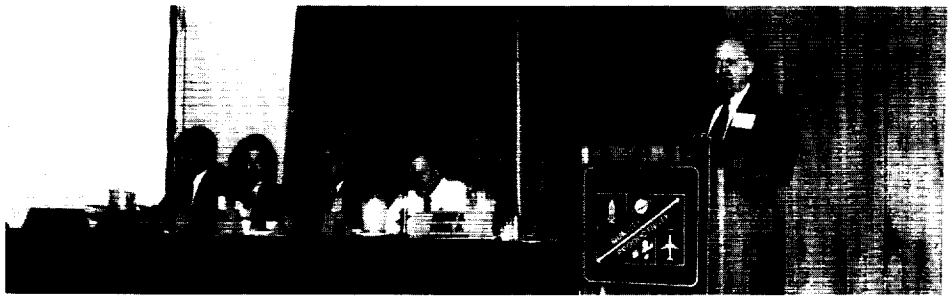
Leadership Success Stories

Government Success Stories

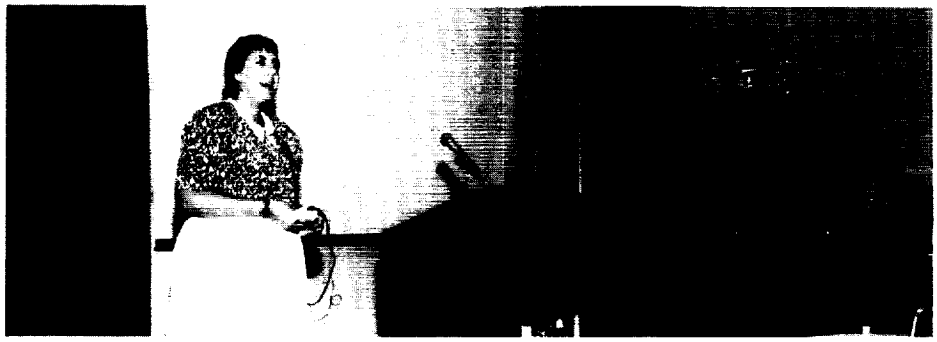


Empowerment: Concepts, Applications, and Experiences

Partnership in Education - A Requisite for Excellence



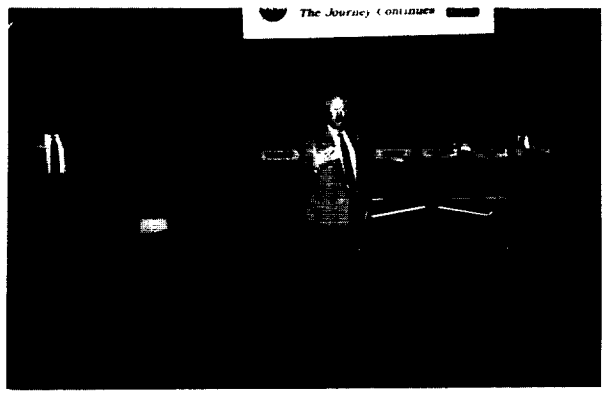
Successful Stories for Implementing System Level TQM/CI Tools



Empowerment: Implementation

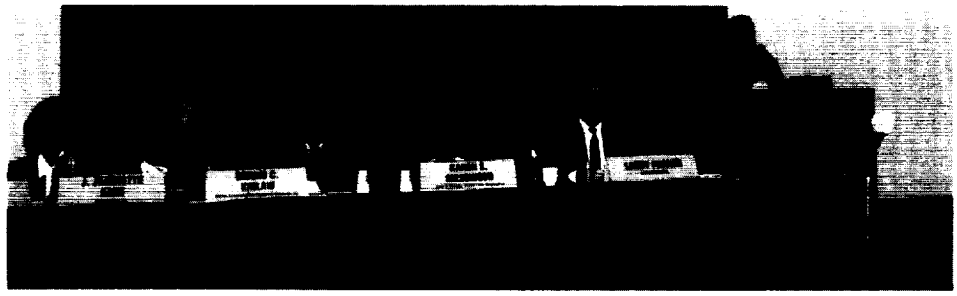
Trust ——→ *Partners* ——→ *Benefits*

Assessing TQM Results: What to Expect

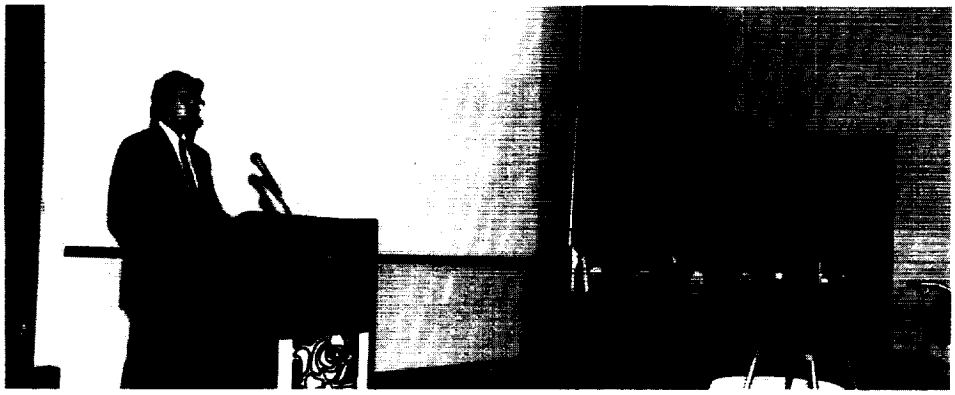


Empowerment: An Interactive Discussion

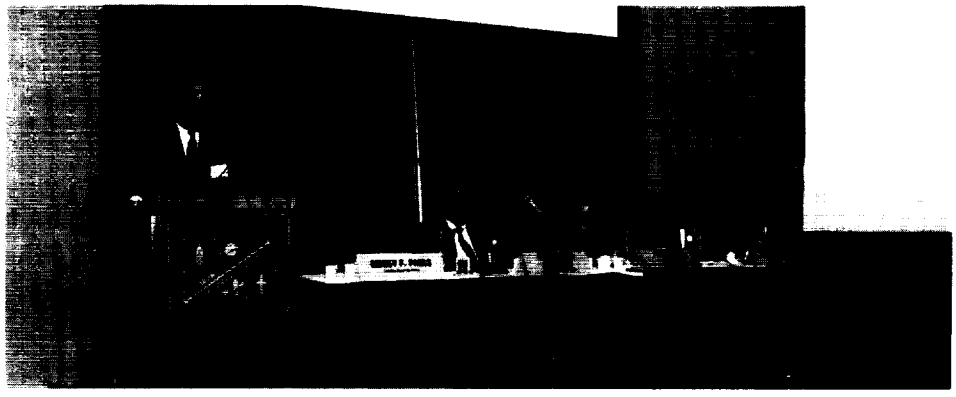
Trust ——————Partners ——————Benefits (Continued)



Planning and Organizing for TQM Integration (Continued)



Successful Stories for Implementing System Level TQM/CI Tools (Continued)



Establishing an Environment for Continuous Improvement at NASA

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